Patent Claims

1. A method for imaging examination of an examination object, in particular a patient (P), in which

a) the examination object is administered a contrast agent (KM),

b) thereafter, at least two spatial distributions ($\mu_1(x,y)$, $\mu_2(x,y)$) of X-ray attenuation values are determined, which X-ray attenuation values in each case represent the local X-ray attenuation coefficient ($\mu(x,y)$), or a variable (C) linearly dependent thereon, the two spatial distributions ($\mu_1(x,y)$, $\mu_2(x,y)$) comprising at least:
   - a first attenuation value distribution ($\mu_1(x,y)$) determined on the basis of a first X-ray spectrum,
   - a second attenuation value distribution ($\mu_2(x,y)$) determined on the basis of a second X-ray spectrum, differing from the first X-ray spectrum,

c) two attenuation value distributions ($\mu_1(x,y)$, $\mu_2(x,y)$) are evaluated and a spatial distribution of one or more predefined atomic number values (Z; Z1, Z2,...) or a spatial distribution (Z(x,y)) of non-predefined atomic number values present in the examination object is determined, which spatial distribution includes information relating to the distribution of the administered contrast agent (KM) in the examination object, and

d) the spatial atomic number distribution (Z(x,y)) is used to represent the contrast agent (KM) by imaging.

2. The method as claimed in claim 1, in which an atomic number value of the contrast agent (KM) is predefined.

3. The method as claimed in claim 1,

in which the spatial atomic number distribution is determined as a two- or three-dimensional field, the respect field value being a local atomic number value $(Z(x,y))$ at the location (x,y) represented by the relevant field.

4. The method as claimed in claim 3, in which in addition to the atomic number distribution a further two- or three-dimensional field is determined whose field values respectively reproduce a local density value $(\rho(x,y))$.

5. The method as claimed in claim 4, in which the determined field having the atomic number values $(Z(x,y))$ and the determined field having the density values $(\rho(x,y))$ are used for the purpose of calculating a local concentration or a local quantity of the contrast agent.

6. The method as claimed in one of claims 1 to 5, in which a contrast agent (KM) having an atomic number greater than 20 is used.

7. The method as claimed in claim 6, in which a contrast agent (KM) having an atomic number greater than 40 is used.

8. The method as claimed in one of claims 1 to 7, in which a contrast agent (KM) having an atomic number less than 83, in particular less than 70, is used.

9. The method as claimed in one of claims 1 to 8, in which the contrast agent (KM) contains gadolinium, iodine, ytterbium, dysposium, iron and/or bismuth.

10. The method as claimed in one of claims 1 to 9,

in which the contrast agent (KM) contains an organic compound, in particular an aliphatic hydrocarbon, for example sugar.

11. The method as claimed in one of claims 1 to 10, in which the contrast agent (KM) contains an amino acid or a peptide.

12. The method as claimed in one of claims 1 to 11, in which the contrast agent (KM) is designed for selective deposition at specific sites or in specific tissue parts of the examination object.

13. The method as claimed in one of claims 1 to 12, in which the contrast agent (KM) is added in a weight concentration from the range of 10^{-4} to 10^{-7}, in particular from the range of 10^{-5} to 10^{-6}.

14. The method as claimed in one of claims 1 to 13, in which a first functional dependence (11) of a first attenuation value of the first attenuation value distribution of density and atomic number, and at least a second functional dependence (41) of a second attenuation value, assigned to the first attenuation value, of the second attenuation value distribution of density and atomic number are determined,
and in which the spatial atomic number distribution - and optionally a spatial density distribution - is/are determined by comparing the first functional dependence (11) with the second functional dependence (41) and, if appropriate, with further functional dependences.